Brief emergency department patient satisfaction scale (BEPSS): Turkish validity and reliability study

Turkish adaptation of brief emergency department patient satisfaction scale

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Abstract

Aim: Evaluation of patient satisfaction constitutes an important step in improving the quality of care. Because of difficulties in evaluating patient satisfaction in the Emergency department, a practical method specific to the emergency department is needed. In this study, the Turkish validity and reliability trial of BEPSS, which evaluates patient satisfaction in the emergency department, was carried out.
Material and Methods: This is a scale validity and reliability study. First, BEPPS was translated into Turkish. The scale was then tested on 200 patients. Based on the data obtained, the construct validity, criterion validity and the reliability of the scale were evaluated.
Results: The average total score of BEPSS was 73.50±10.345. In the explanatory factor analysis for construct validity, the eigenvalue of a factor was found to be 5.282, and the total variance was 75.46%. According to the Cronbach alpha coefficient used in the reliability analysis, the internal consistency of the scale was 0.79. In the correlation matrix, it was seen that there was a positive and average correlation between the items of the scale.
Discussion: In the study, it was found that the Turkish version of BEPSS was appropriate in terms of criterion validity, structural validity, and reliability.

Keywords

Patient Satisfaction; Emergency Department; Validity; Reliability; Scale

Introduction

Patient satisfaction is a concept directly related to the quality of the healthcare provided to patients [1]. The increase in the value given to the patient and the quality of healthcare affect patient satisfaction positively [2]. Due to the increasing competition in the health sector, patient satisfaction and health service quality have become increasingly important in recent years [3]. There are many different factors that affect patient satisfaction [4]. Factors affecting patient satisfaction include the number of healthcare professionals in the hospital, bed capacity of the hospital [5], patient s age, communication between the patient and the healthcare provider [6], waiting time of the patients, mutual empathy, respect for patients and their relatives, and patient privacy [7].

Patient satisfaction surveys used to evaluate the level of patient satisfaction often focus on the hospital environment, the health care provided to the patient, and the attitude of hospital staff [4]. However, features such as Emergency department crowding [8], the urgency of the patient's condition, long waiting times, and anxiety of patients or their companions, which distinguish the emergency department from other departments, can directly affect patient satisfaction [9]. For this reason, it will be appropriate to use a specialized patient satisfaction survey for the emergency department. Atari et al. developed the "Brief Emergency Department Patient Satisfaction Scale (BEPSS)", which evaluates patient satisfaction in different aspects for the emergency department. BEPSS is a patient satisfaction questionnaire specific to the emergency department, as it is prepared based on emergency department-specific problems. This scale, prepared in English, questions the satisfaction level of the patients through 20 questions under 5 subgroups [10].

This study aimed to translate BEPSS into Turkish and conduct the validity and reliability study of BEPSS for Turkish society.

Material and Methods

Study Design and Ethics

This study is a scale validity and reliability study carried out prospectively. Study was approved by the local ethics committee (2019-GOKAE-1096).

Study Setting

This study was conducted in the ED of a training and research hospital with 350,000 annual ED visits.

Patient Selection

Patients aged 18 and over who presented to the emergency department and volunteered to participate were included in the study. Patients with a history of alcohol or drug use within the last 48 hours, patients who were unconscious or intubated, patients who refused to participate in the study, and patients who did not complete the questionnaire were excluded from the study (Figure 1)

Data collection

A single questionnaire including the Brief Emergency Department Patient Satisfaction Scale (BEPSS), demographic data of the patients and the Numeric Rating Scale (NRS) that measures the patient's satisfaction level was used to collect the data. BEPSS consists of 5 subgroups and a total of 20 questions evaluating patient satisfaction in the ED. The subgroups of the scale are emergency department staff (EDS) consisting of 6

questions, emergency department environment (EDE) consisting of 3 questions, physician care satisfaction (PCS) consisting of 4 questions, general patient satisfaction (GPS) consisting of 5 questions and patient's family satisfaction (PFS) consisting of 2 questions. BEPSS is a Likert-type scale with each question scored between 1 and 4. Among the points given in response to the questions, 1 point means completely disagree, 2 points mildly disagree, 3 points mildly agree, and 4 points completely agree. By collecting the points given by the patient to each item, the patient's emergency satisfaction score is obtained. While the minimum score that can be obtained from the whole scale is 20, the maximum score is 80. While a score of 20 points taken from the scale indicates complete dissatisfaction of the patient, a score of 80 points indicates complete satisfaction. The demographic data collection form includes age, gender, time for presentation to the emergency department, waiting time before seeing the doctor, patient's triage category, hospitalization status of the patient (outpatient/hospitalization/ intensive care), previous medical history, educational status, and smoking information. The Numeric Rating Scale (NRS), which measures the level of satisfaction in order to compare with BEPSS, is scored between 0 and 10, while "0" means complete dissatisfaction, "10" means complete satisfaction [11]. Verbal consent was obtained from all patients before the questionnaires were filled. The questionnaire was completed by the patients themselves. For elderly or visually impaired patients, the questionnaire form was read out loudly by the researcher, and the patient's responses were written on the form by the researcher. However, in conditions where it was not possible for the patient to complete the questionnaire for any reason, one of the patient's relatives was asked to complete it. The questionnaire was completed just before the patient left the ED. For any patient who needed immediate treatment for a life-threatening condition, after the patient's treatment was completed, one of the relatives of the patient was politely asked to complete the questionnaire form.

Preparation of the Turkish Version of the Scale

Firstly, in order to prepare the Turkish adaptation of the scale, permission to use the scale was obtained by e-mail from Mohammad Atari, the developer of the original version of BEPSS. Turkish adaptation of the scale, completed in 6 steps, was prepared based on the guideline developed by Beaton et al. [12].

First step: The scale was translated into Turkish separately by an emergency medicine specialist who knew the concept of the study, whose native language was Turkish and who could speak English well, as well as an English foreign language lecturer who was not familiar with the concept and whose native language was English.

Second step: Both the Turkish translations of the scale and the original English version of the scale were synthesized by two translators, accompanied by an observer, and a single Turkish version was created.

Third step: The Turkish version of the scale has been retranslated into English by two translators whose native language was English and who spoke Turkish well and were blinded to the original version of the scale.

Fourth step: This is the step where the translations were

evaluated by a committee and the Turkish version of the scale was finalized. In this step, the meaning compatibility between the Turkish version of the scale and the original English version was evaluated. The committee included an emergency medicine specialist and an English lecturer who were translators of the original scale into Turkish, and two translators who retranslated the scale back to English.

Fifth step: In this step, the Turkish version of the scale, approved by the committee, was evaluated for clarity in a pilot study of 30 participants. The volunteers who filled the questionnaire were asked to evaluate each item on the scale for clarity. In this pilot study, it was determined that there was no item that could not be understood by the patients.

Sixth step: In this step, the version of the scale retranslated from Turkish to English and the final Turkish version of the scale were sent to Mohammad Atari, the developer of the scale, and his approval was obtained.

After the 6-step stage in which the Turkish version of the scale was prepared, the validity and reliability study of the Turkish version of BEPSS was performed. In this study, patients presented to the emergency department were asked to fill in the questionnaire after verbal consent was obtained. The research was terminated when the targeted 200 participants were reached. The Turkish validity and reliability of BEPSS were investigated as described in the statistical analysis section.

Sample Size

It is stated in the literature that a sample of 10 times the number of items on the scale is ideal for scale validity and reliability studies [13]. Since there were 20 items on this scale, the sample size was determined as 200.

Statistical Analysis

The data obtained in the study were analyzed using the SPSS 20.0 package program for Windows (IBM Corporation, Armonk, New York, USA). While evaluating the study data, the frequency distribution (number, percentage) for categorical variables and descriptive statistics (mean, standard deviation) for numerical variables were used. In statistical analysis, Type-1 error was taken as $\alpha = 0.05$ for statistical significance. The Cronbach Alpha Reliability Coefficient, which is one of the internal consistency methods, was used in the reliability study. The Kaiser-Meyer-Olkin (KMO) coefficient and Barlett tests were used to evaluate the feasibility of factor analysis, and factor analysis is used to evaluate the suitability of the construct validity of the scale. For criterion validity, BEPSS's correlation with the NRS satisfaction scale was examined. The relation between subgroups of the scale was examined using the Spearman Correlation analysis.

Results

Socio-Demographic Characteristics of Patients

A total of 200 patients participated in the study. The average age of the patients was 46 ± 20.92 years, and 46% were women. The triage category of 102 (51%) patients was green, 70 (35%) were yellow and 28 (14%) were red. One hundred fifty-seven (78.5%) of the patients included in the study were discharged from the emergency department, 133 (16.5%) were hospitalized and 10 (5%) were admitted to the intensive care unit.

The average total BEPSS score was 73.50 ± 10.345 and the average NRS satisfaction score was 8.84 ± 1.75. Looking at the average scores of the BEPSS subgroups, average EDS score was 21.80 ± 4.030, average EDE score was 10.50 ± 2.110, average PCS score was 15.41 ± 1.821, the GPS scale score was 18.40 ± 3.129 and average PFS score was 7.28 ± 1.466.

When the relationship between NRS satisfaction score and BEPSS subgroup scores were examined one by one, there was a positive and significant relationship between them (p=0.0001). In addition, when the patients' responses to the scale were evaluated using the Spearman Correlation analysis, it was calculated that the subgroups had a positive relationship with each other, as shown in Table 1 (p=0.00001).

Reliability Analysis

Cronbach's alpha coefficient was used in the reliability analysis where the internal consistency of BEPSS was evaluated. When the correlation between subgroup items and the correlation of BEPSS with subgroup items were evaluated, the correlation coefficients were found to be in the range of 0.56-0.80 (p=0.0001), and the internal consistency of the scale was 0.79.

Validity Analysis

The Kaiser-Meyer-Olkin (KMO) coefficient, which evaluates the adequacy of the sample size, was found to be 0.64 and the Bartlett Test ($x2 = 1782.42$, SD = 12, p=0.00001), in which the suitability of the scale was evaluated was found to be significant. In the explanatory factor analysis for construct validity, the eigenvalue of a factor was found to be 5.282, and the total variance was 75.46% as shown in Table 2.

When the relationship between the items of the scale was examined in the correlation matrix, it is seen that there is a positive and average relationship, as shown in Table 3. Since it is the only factor, Varimax rotation cannot be done.
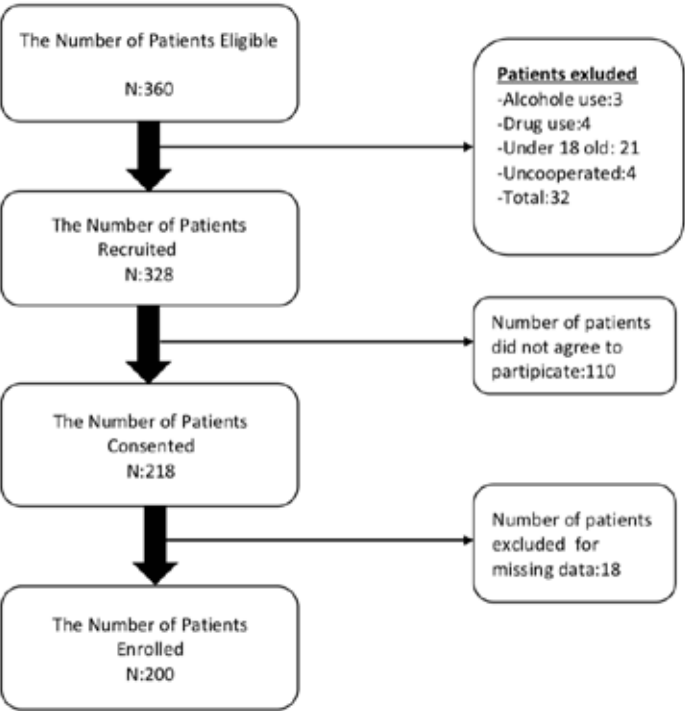
Figure 1. Patient Flow Chart

Table 1. Correlation Coefficients of BEPSS, BEPSS Subgroup Items and NRS Satisfaction

	EDS	EDE	PCS	GPS	PFS	BEPSS	NRS satisfaction	p
EDS	1.000							
EDE	0.530	1.000						
PCS	0.468	0.493	1.000					
GPS	0.465	0.569	0.455	1.000				0.0001
PFS	0.560	0.512	0.514	0.577	1.000			
BEPSS	0.779	0.803	0.568	0.734	0.678	1.000		
NRS Satisfaction	0.706	0.767	0.548	0.711	0.610	0.897	1.000	

EDS: Emergency Department Staff, EDE: Emergency Department Environment, PCS: Physician Care Satisfaction, GPS: General Patient Satisfaction, PFS: Patient's Family Satisfaction, BEPSS: Brief Emergency Patient Satisfaction Scale, NRS: Numeric Rating Scale

Table 2. Factor analysis for BEPSS

Component	Total value	% (Variance)	% (Total)
EDS	5.282	75.454	75.454
EDE	0.525	7.501	82.955
PCS	0.428	6.119	89.074
GPS	0.390	5.571	94.645
PFS	0.272	3.881	98.526
BEPSS	0.094	1.339	99.865
NRS Satisfaction	0.009	0.135	100.000

EDS: Emergency Department Staff, EDE: Emergency Department Environment, PCS: Physician Care Satisfaction, GPS: General Patient Satisfaction, PFS: Patient's Family Satisfaction, BEPSS: Brief Emergency Patient Satisfaction Scale, NRS: Numeric Rating Scale

Table 3. Correlation Matrix Investigation to Evaluate the Contribution of the Subgroup Items to the Scale

	EDS	EDE	PCS	GPS	PFS	PFS	NRS Satisfaction
EDS	1.000						
EDE	0.605	1.000					
PCS	0.641	0.569	1.000				
GPS	0.591	0.714	0.634	1.000			
PFS	0.533	0.594	0.526	0.605	1.000		
BEPSS	0.846	0.817	0.803	0.874	0.736	1.000	0.932
NRS Satisfaction	0.808	0.817	0.716	0.787	0.707	0.932	1.000

EDS: Emergency Department Staff, EDE: Emergency Department Environment, PCS: Physician Care Satisfaction, GPS: General Patient Satisfaction, PFS: Patient's Family Satisfaction, BEPSS: Brief Emergency Patient Satisfaction Scale, NRS: Numeric Rating Scale

Discussion

In this study, the Turkish version of BEPSS developed by Atari et al. evaluating patient satisfaction in the emergency department was prepared, and its validity and reliability study was performed. Within the scope of the study, firstly, Turkish version of the scale was prepared and then criterion validity, construct validity, internal consistency and explanatory factor analysis were evaluated. It was seen that the scale was valid and reliable and it was appropriate to be used in Turkish society.

Validity Analysis

The purpose of the validity analysis is to examine whether the items of the scale represent the area or behavior desired to be measured, and to form an entirety of meaningful items by a group of experts [14,15]. The only condition for measuring criterion validity is that there is a suitable and valid criterion to compare. The aim is to establish the relationship between the valid measurement tool and another measurement tool [16]. In this study, concurrent validity was used to measure criterion validity. In concurrent validity, the score obtained from the scale to be tested is compared with the score obtained from another scale, measuring the same or similar behavior. The tests to be compared should be carried out simultaneously or within a close time [17]. In this study, NRS satisfaction and BEPSS were performed simultaneously. A positive correlation was found between BEPSS and NRS satisfaction. According to these results, the criteria validity of BEPSS has been confirmed. The Kaiser-Meyer-Olkin (KMO) coefficient and Barlett tests are used to evaluate the feasibility of factor analysis [18]. The KMO coefficient must be over 0.50 for factor analysis. In addition, the interpretation of the KMO coefficient between 0.70 and 0.80 is moderate, between 0.80 and 0.90 is good, and above 0.90 is excellent sampling [19]. The Bartlett test is used to evaluate the suitability of items on the scale for the factor analysis of the correlation matrix [18]. In this study, the KMO coefficient was determined as 0.64 and the Bartlett test was significant. In the light of these findings, it was concluded that the sample size for the study was sufficient and feasible for factor analysis.

Factor analysis is used to evaluate the suitability of the construct validity of a scale. When conducting exploratory factor analysis, it is necessary to take into account whether the scale has a single or multi-factor structure. In single-factor scales, the scale is expected to explain at least 30% of the total variance, while in multi-factor scales this value should be even higher (20). In the exploratory factor analysis evaluating BEPSS, when the items of the scale were compared through factor analysis, it was found that the initial eigenvalue of one factor was 5,282 and the total variance was 75,46%. Since this value explains the variance of the scale, the scale can be explained using a single factor. According to these results, it can be said that the structural validity of the scale was confirmed.

Reliability Analysis

Reliability analysis means that the scale can reflect the structure it measures consistently. In reliability studies, Cronbach's alpha value is used while evaluating internal consistency, which shows that the scale items are consistent with each other and contribute to the scale in the same direction. In order to say that the scale is reliable, Cronbach's alpha value must be above 0.70 [21]. In this study, Cronbach's alpha value was found to be 0.79 in the internal consistency analysis for BEPSS. According to this result, it can be said that the Turkish version of BEPSS is reliable.

Conclusion

This study shows that the Turkish version of BEPSS is an easy-to-use, reliable and valid instrument that can be used to evaluate patient satisfaction in the emergency department. Patient satisfaction assessments that will be performed in the emergency department using BEPSS will enable the identification of problems specific to the emergency department and the improvement of health care provided to the patients.

Scientific Responsibility Statement
The authors declare that they are responsible for the article's scientific content including study design, data collection, analysis and interpretation, writing, some of the main line, or all of the preparation and scientific review of the contents and approval of the final version of the article.

Animal and human rights statement
All procedures performed in this study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. No animal or human studies were carried out by the authors for this article.

Conflict of interest
None of the authors received any type of financial support that could be considered potential conflict of interest regarding the manuscript or its submission.

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